R A N - 1 8 0 3 0 0 0 2 0 1 0 3 0 0 9 1

RAN-1803000201030091

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F. Y. B. Sc. (Sem. - I) Examination

March - 2023

Electronics : Paper - I

Basic Electrical Circuits

[Total Marks: 50

સૂચના : / Instructions

(1)

નીચે દર્શાવેલ ☛ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fill up strictly the details of ☛ signs on your answer book

Name of the Examination:

☛ **F. Y. B. Sc. (Sem. - I)**

Name of the Subject :

☛ **Electronics : Paper - I Basic Electrical Circuits**

Subject Code No.: **1803000201030091**

Seat No.:

Student's Signature

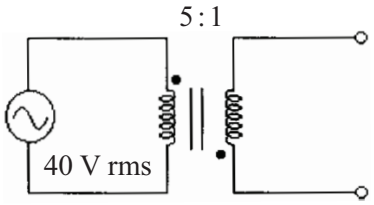
(2) Figure on right indicate full marks.
(3) Non programmable Calculator is allowed.
(4) All symbols and abbreviation have their usual meanings.
(5) Assume Data if necessary.

***O.M.R. Sheet* ભરવા અંગેની અગત્યની સૂચનાઓ આપેલ *O.M.R. Sheet*ની પાછળ છાપેલ છે.**
Important instructions to fillup O.M.R. Sheet are given on back side of the provided O.M.R. Sheet.

Section - I

Each question carries 1 marks **(20)**

Q. 1. What is the secondary voltage in the given circuit?



a) 8 v rms out of phase
b) 200 v out of phase
c) 200 v in phase
d) 8 v rms in phase

Q. 2. The Energy band of Valance band and Conduction band in Conductor, semiconductor and Insulator is _____ respectively.

a) Little apart, Overlap, Far apart
b) Far apart, Overlap, Little apart
c) Overlap, Little apart, Far apart
d) Little apart, Far apart, Overlap

Q. 3. In a series electronic circuit with E = 15 V, R1 = 6 Ω and R2 = 5 Ω the current is equal to

a) 1.36 A
b) 0.136 A
c) 1.36 mA
d) 0.00136

Q. 4. Three capacitor of value 1 μF, 3μF and 8μF are connected in series, what is its total Capacitance :

a) 6.66 μF
b) 0.66 μF
c) 12 μF
d) 0.12 μF

Q. 5. How is a 3.9 kΩ+/– 5% resistor color-coded?

a) Red, white, red, Gold
b) Red, white, red, Silver
c) Red, white, red
d) All

Q. 6. _____ is often used to analyze multiple source circuit.

a) Thevenin's Theorem
b) Superposition Theorem
c) Norton's Theorem
d) Kirchhoff's Law

Q. 7. With Ohm's law, if voltage increases and the current increases:

a) Can't say
b) Resistance increases
c) Resistance remains the same
d) Resistance decreases

Q. 8. What current is flowing in the circuit, with 12 V dc battery in series with 24k Ω resistor?

a) 500A
b) 500mA
c) 500μA
d) None

Q. 9. Kirchhoff's Current Law, states that algebraic sum of _____ at _____ is zero.

a) Voltage, junction
b) voltage, Branch
c) Current, Junction
d) Current, branch

Q. 10. For $P = V^2/R$, a increase in resistance should produce.

a) A decrease in power
b) An increase in power
c) An increase in Voltage
d) A decrease in current

Q. 11. When a 1 μF capacitor is connected to a 2 kHz source, what is its capacitive reactance?

a) 0.796 Ω
b) 796.10 Ω
c) 79.61Ω
d) 7.96 Ω

Q. 12. To make a N-type Extrinsic semiconductor _____ impurities are dopped.

a) Trivalent
b) Tetravalent
c) Pentavalent
d) None

Q. 13. As a capacitor is being charged, current flowing into the capacitor will _____ and voltage will _____.

a) Increase, increase
b) Decrease, decrease
c) Increase, decrease
d) Decrease, increase

Q. 14. A color code of orange, orange, orange, silver is for what Ohmic value and Tolerance?

a) 33KΩ, +/– 5%
b) 33KΩ, +/– 10%
c) 22KΩ, +/– 10%
d) 22KΩ, +/– 5%

Q. 15. The value of which component depends on Dielectric material, Spacing between the plates and area of plates overlapping.

a) Capacitor
b) Resistor
c) Inductor
d) Transformer

Q. 16. With Ohm's law:

a) Resistance is directly α to voltage
b) Current is directly α to resistance
c) Voltage is indirectly α to power
d) Current is inversely α to resistance

Q. 17. According to Norton's theorem, any network with two open terminals can be replaced by - _____ source in _____ with a single Resistance R_N.

a) Current, parallel
b) Current, series
c) Voltage, series
d) Voltage, parallel

Q. 18. Potentiometer is _____ terminal component and used to change.

a) 3, Voltage
b) 4, Current
c) 2, Current
d) 2, Voltage

Q. 19. A Capacitor stores 0.20 μ Coulomb of charge at 5 Volts. Its Capacitance is

a) 0.04 F
b) 0.4 μF
c) 0.04 μF
d) 4 μF

Q. 20. A voltage is induced in a transformer secondary winding by the action of the:

a) Secondary magnetic field
b) Primary turns ratio
c) Primary magnetic field
d) Secondary counter emf

Section - II

Each question carries 2 marks

Q. 21. Which one of them is not active component?

a) Diode
b) Transistor
c) Capacitor
d) Zener Diode

Q. 22. The electric energy consumed by Capacitor is stored in the form of a

a) Magnetic field
b) Force field
c) Electromagnetic field
d) electric field

Q. 23. The parallel connection of three resistor R1, R2 and R3 is given by

a) $\frac{1}{RT} = \frac{1}{R1} + \frac{1}{R2} + \frac{1}{R3}$
b) $R_T = R1 + R2 + R3$
c) $R_T = \frac{1}{R1} + \frac{1}{R2} + \frac{1}{R3}$
d) None of the above

Q. 24. The Transformer rating is

a) KW
b) KVA
c) KIA
d) KWHA

Q. 25. Semiconductor are _____ and _____ and have _____ valence electron:-

a) Copper, Iron, Five
b) Germanium, Silicon, Four
c) Silicon, Germanium, Five
d) Iron, Copper, Four

Q. 26. Movement of holes is due to

a) Movement of Conduction band electron
b) Movement of holes in conduction band
c) Movement of valance band electron
d) None

Q. 27. What is the equivalent resistance if 4 resistances of 1k Ω each are connected in parallel.

a) 250 Ω
b) 4k Ω
c) 2k Ω
d) 1k Ω

Q. 28. The resistance of wire

a) Proportional to length of wire
b) 1/α area of Cross section
c) Depends on resistivity
d) ALL

Q. 29. If in a circuit R1 = 40 Ω, R2 = 60 Ω and R3 = 100 Ω and are connected in series with current I = 0.5 A then the value of E = ?V.

a) 198 V
b) 100 V
c) –200 V
d) 200 V

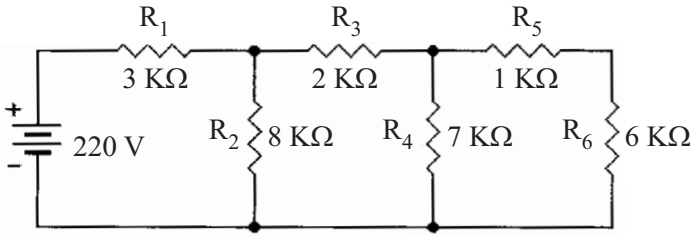
Q. 30. What is the total inductance if 10 mH and 100 mH is connected in Parallel

a) 99 mH
b) 0.99 mH
c) 110 mH
d) 9.09 mH

Q. 31. How many amperes used by 60 watt, 120 V light bulb?

a) 500 mA
b) 0.5 mA
c) 200 mA
d) 2 mA

Q. 32. What is the power dissipated by R2, R4, and R6?



a) 1640mW, 758.57mW, 650.20mW
b) 1640kW, 758.57kW, 650.20kW
c) 1.640mW, 7.5857mW, 6.5020mW
d) 16.40mW, 75.857mW, 65.020mW

Q. 33. With 42 voltage applied, If R1 is 10 Ω, R2 = 70 Ω and R3 = 30Ω, What is current of R2, If R1 is in series connected with parallel connection of R2 and R3.

a) 406.45 mA
b) 800 mA
c) 600 mA
d) 4.06mA

Q. 34. What are the values of resistors with colour codes: Brown, Black, Red and Brown, Black, Orange

a) 1 K Ω, 10 K Ω
b) 1 K Ω, 20 K Ω
c) 10 K Ω, 1 K Ω
d) 100 Ω, 10 Ω

Q. 35. In a series circuit with E = 40 V, R1 = 8Ω and the voltage drop across R2 is 15V. Find the Voltage drop across Rl and the resistance value of R2.

a) 25 V, 4.8 Ω
b) 10.5 V, 2.4 Ω
c) 12.5 V, 2.4 Ω
d) 11.5 V, 2.4 Ω

SPACE FOR ROUGH WORK